

A new species of *Bathytoma* (Gastropoda: Borsoniidae) from the Philippines

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ABSTRACT

A new species of Borsoniidae, *Bathytoma gordonlarki* new species, is described from the Philippines. Specimens were collected in tangle nets in 300–500 m off Balut Island, which is located on the eastern side of the Celebes Sea. The new species is similar to *B. boholica*, a species collected in the central Philippines. However, *B. gordonlarki* has a broader body and a larger spire angle than *B. boholica*. The discovery of this species is important because it demonstrates that even in areas where the fauna has been studied there remains undiscovered diversity.

Additional keywords: Mollusca, Conoidea, tangle nets, Balut Island

INTRODUCTION

The genus *Bathytoma* sensu lato contains at least 100 valid named species (Tucker, 2004). Two-thirds of these are fossil species with a stratigraphic range from Eocene to the Pleistocene. The other one-third are extant species. Remarkably, about half of the Recent species have been described since 1986, with 14 species new to science introduced between 2004 and 2010. All of these species were described from South African or Indo-Pacific localities.

Bathytoma is an important genus of the Borsoniidae (Tucker and Tenorio, 2009). These mollusks have some of the largest shells among the turrids (sensu lato) and commonly reach 50 mm in shell length. Puillandre et al. (2010) described eleven new species of *Bathytoma* from the western Pacific. They suggested that the large number of previously unrecognized species was due to sympatric and fine-scale allopatric speciation. *Bathytoma* may prove to be a source of unrecognized biodiversity in the deep waters of the Indo-Pacific region. Herein, we describe another new species of *Bathytoma* from the Philippines. The shell morphology of the new species is unique and easily distinguishes it from morphologically similar congeners.

MATERIALS AND METHODS

Specimens of the new species were acquired from local fishermen. These were collected using tangle nets in water depth ranging from 300 to 500 m. They had already been cleaned and were empty shells when received. Measurements made for each specimen included the shell length, shell width, and spire length using methods adapted from Röckel et al. (1995). The spire angle was measured from photographic enlargements.

We also examined three specimens of *Bathytoma boholica* also collected off Balut Island in deep water (Santa Barbara Museum of Natural History, SBMNH 424101–424103). Spire angles were measured from images of the holotype of *B. boholica* (Zoologische Staatssammlung München, ZSM 1877), of the holotype of *B. badifasciata* (Muséum national d'Histoire naturelle, MNHN IM2007718120), which was collected in 473–505 m, from the Solomon Islands, 9°44' S, 160°49' E, and of the holotype of *B. consors* (MNHN IM200718116), which was collected in 520–581 m, from the Solomon Islands, 10°25' S, 161°20' E.

SYSTEMATICS

Superfamily Conoidea Fleming, 1822

Family Borsoniidae Bellardi, 1875

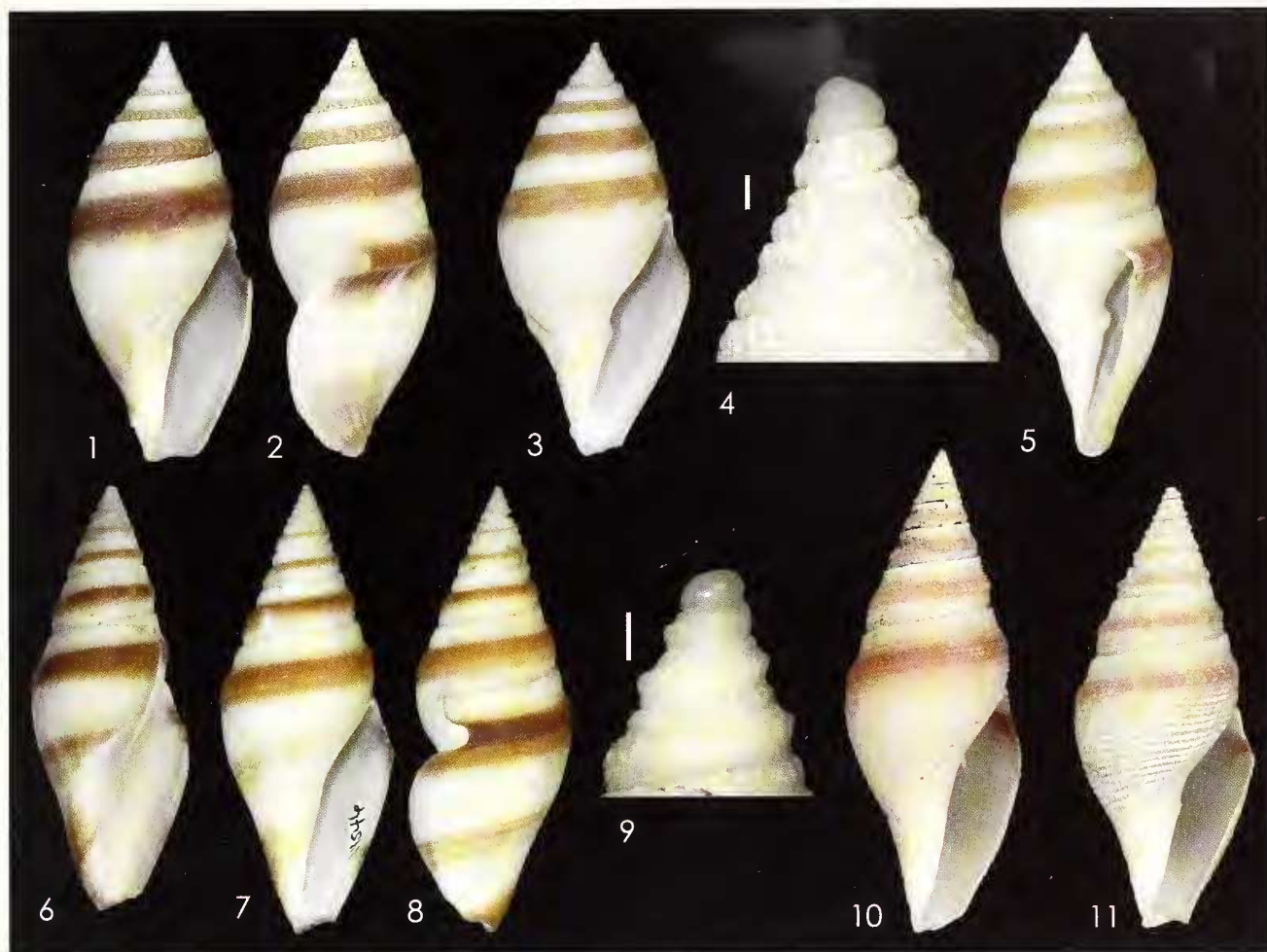
Genus *Bathytoma* Harris and Burrows, 1891

Nomen novum pro Dolichotoma Bellardi, 1875, non Hope, 1839

Type Species: *Murex cataphractus* Brocchi, 1814, by monotypy (of *Dolichotoma*).

***Bathytoma gordonlarki* new species**
(Figures 1–5)

Diagnosis: Species of *Bathytoma* with small or obsolete peripheral gemmules, with broad ovate swollen teleoconch whorls, and spire angle of more than 55 degrees.



Figures 1–11. *Bathytoma* species. 1–5. *Bathytoma gordonlarki* new species. 1–2, 4. Holotype, MSI, shell length = 55.9 mm. 1. Ventral view. 2. Lateral view showing sinus. 4. Spire and protoconch. Scale bar = 1 mm. 3. Paratype, SBMNH 424100, shell length = 51.4 mm. 5. Paratype SBMNH 424100, ventral view showing columellar plait, shell length = 58.5 mm. 6–9. *Bathytoma boliolica* Parth, 1994. 6. Holotype, ZSM 1877, shell length = 62.5 mm. 7–9. SBMNH 424102, shell length = 52.2 mm. 7. Ventral view. 8. Lateral view showing the sinus. 9. Spire and protoconch, scale bar = 1 mm. 10. *Bathytoma badifasciata* Puillandre et al., 2010, holotype, MNHN IM200718120, shell length = 61.0 mm. 11. *Bathytoma consors* Puillandre et al., 2010, holotype, MNHN IM200718116, shell length = 45.9 mm.

Description: Shell length 43.8–58.2 mm, shell width 21.3–26.2 mm. Shell shape sub-biconic with rounded swollen body whorl (Figure 1). Spire about 27% of shell length. Protoconch diameter 1.2 mm in diameter, of about 2 whorls (Figure 4), smooth, white. Teleoconch of 8.5 (holotype) to 9.75 (largest paratype) whorls. Suture narrowly channeled. Subsutural ramp complex, consisting of an anterior rounded, almost swollen area, mostly covered by a brown band. Posterior half of subsutural ramp set at steep angle and flat, white. This combination produces a subsutural ramp concave in profile (Figures 1, 3). Spiral sculpture of 11–13 spiral cords minutely to distinctly pustulose. Pustules formed at junction of spiral cords and elevated arcuate axial lines that cross whorl top. About six spiral cords present on posterior half of subsutural ramp and

about five on anterior convex portion of subsutural ramp. Spiral cords continue onto body whorl where they become less pronounced and somewhat smoother. Peripheral gemmules are absent but there is a narrow row of closely set arcuate folds at junction of the spire and body whorl (Figure 2). Anal sinus deep, U-shaped, set on anterior half of subsutural ramp (Figure 2). Fine growth lines trace former position of anal sinus and continue onto body whorl. Color light- to dark-brown on spire and shoulder. Anterior shell third may also have brown color (Figure 2). This color pattern may be slightly to almost totally absent (Figures 3, 5) or may consist of a distinct brown band (Figure 2). Interior of aperture white. Columellar plait distinct. Plait narrow, oblique to coiling axis, well-developed, about 1.3 mm tall (Figure 5).

Type Material: Holotype (55.9 mm length \times 25.2 mm width) deposited at the Philippine Biodiversity Resource Center, Marine Science Institute (MSI), University of the Philippines. Two paratypes deposited at the Santa Barbara Museum of Natural History (SBMNH 424100). Three paratypes are respectively deposited at the Museum of Comparative Zoology, Cambridge (MCZH 372642), Academy of Natural Sciences, Philadelphia (ANSP 425053), and Muséum national d'Histoire naturelle, Paris (MNHN 23281). All type material collected by fishermen using gangle nets.

Type Locality: Off Balut Island, Celebes Sea, Philippines, 5°24' N, 125°23' E, 300–500 m depth.

Distribution: The new species is known from Balut Island on the eastern side of the Celebes Sea south of Mindanao, then north to Bohol Island in the central Philippines (Parth, 1994).

Etymology: We honor Gordon Lark on the occasion of his 80th birthday. He was the founding chairman of the Department of Biology, University of Utah. The second author (BMO) is deeply indebted to him for his guidance and friendship over the years.

Remarks: *Bathytoma gordonlarki* new species is similar in coloration to *B. boholica* Parth, 1994 (Figures 6–8) from the Philippines, *B. badifasciata* Puillandre et al., 2010 (Figure 10) and *B. consors* Puillandre et al., 2010 (Figure 11), both from the Solomon Islands. All these species have brown bands developed to one extent or another. The new species, *B. gordonlarki* differs from those three species and all other *Bathytoma* species in shell and spire shape. The body whorl of *B. gordonlarki* is convex with rounded sides, with swollen aspect (Figure 1). All the other species of *Bathytoma* are more slender. Moreover, the spire angle of *B. gordonlarki* is much greater than in the other three similarly colored species. The spire angle of the type series of *B. gordonlarki* averaged almost 57°. It averaged 39° for three specimens of *B. boholica*, 44° for the holotype of *B. badifasciata* (Figure 10) and 46° for the holotype of *B. consors* (Figure 11).

Parth (1994: fig. 2, left) included a specimen of *B. gordonlarki* as a paratype of *B. boholica*. This specimen was collected from Panglao, Bohol Island, with the holotype and other paratypes of *B. boholica*. We were not able to examine the specimen but the illustration is certainly of a typical specimen of *B. gordonlarki*. Parth's holotype (Figure 6) is identical to what we identify as *B. boholica* (Figures 7–9). Sysoev and Bouchet (2001: fig. 96) and Sysoev (2008: pl. 661, fig. 7) also misidentified specimens of *B. gordonlarki* as *B. boholica*. Puillandre et al. (2010: fig. 1.11) illustrated the same specimen that Sysoev and Bouchet did and identified it as *B. boholica*. Confusion with *B. boholica* may be the reason why this large and apparently common species has remained undescribed.

DISCUSSION

Despite describing 11 new species of *Bathytoma* from the Indo-Pacific, Puillandre et al. (2010) considered that the actual species diversity of the genus was still underestimated in the western Pacific. Our contribution adds yet another species to this group. Considering that most of the species of *Bathytoma* have non-planktotrophic development, which constrains the ranges of individual species (Puillandre et al., 2010), it is likely that continued collecting in other regions of the Philippines and western Pacific will reveal other new species recognizable by conchological and molecular methods.

It is noteworthy that both *B. boholica* and *B. gordonlarki* are sympatric at Balut and Bohol Islands in the Philippines. In contrast, of the 14 species-group taxa found by Puillandre et al. (2010), 11 were mutually allopatric. Like the other species pairs reported by Puillandre et al. (2010), the *boholica-gordonlarki* species pair could also suggest possible sympatric speciation in these deep-water conoideans. However, bathymetric allopatry cannot be eliminated here, as depth estimates from fishermen are often inaccurate.

ACKNOWLEDGMENTS

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